

Nonresidential HVAC and Envelope Measures

February 4, 2003 Workshop



Time Dependent Valuation

- Proponent: Pacific Gas & Electric
 - Workshop: April 2
 - Standard: Both
 - TDV energy replaces source energy throughout the Standards and the ACM manuals.
- Changes since the November 2002 draft:**
- Joint Appendix III added to explain the TDV values.



Nonresidential Schedules

- Proponent: Pacific Gas & Electric
- Workshop: April 2
- Standard: NR Modeling
- Schedules were researched from the NRNC database.

Changes since the November 2002 draft:

- The “nonresidential” schedule has been revised.
- A new retail schedule has been added.
- ACM Table 2-3 modified.



Prescriptive Requirements for Skylights

- Proponent: Pacific Gas & Electric
 - Workshop: May 30
 - Standard: NR Envelope & NR Lighting
- Skylights are prescriptively required for some large, low-rise enclosed spaces. Prescriptive requirements will provide basis for performance standard building.
 - Specific lighting control requirements are discussed with Nonresidential Lighting.
- Changes since the November 2002 draft:**
- ACM language has been developed.



Cool Roofs Prescriptive Requirement

- Proponent: Pacific Gas & Electric
- Workshop: May 30
- Standard: NR Envelope
- §143 makes cool roofs a prescriptive requirement for low-slope applications.
- Trade-off procedures treat reflectance as a continuous variable in compliance process.
- Reflectance and emittance used for compliance must be provided through CRRC-1-2002.

Changes since the November 2002 draft:

- Durability standards for liquid applied coatings have been changed.



Relocatable Public School Buildings

- Proponent: Pacific Gas & Electric
 - Workshop: July 18
 - Standard: NR Envelope
 - Criteria added to §143 and §149.
- Changes since the November 2002 draft:**
- Clarified that moving a relocatable public school buildings does not trigger §149; however any alteration to the envelope, space conditioning, lighting, or water heating does.
 - ACM ND added, which explains the performance standards for relocatables.





Lay-in Ceiling Insulation

- Proponent: Pacific Gas & Electric
 - Workshop: August 8
 - Standard: NR Envelope
- Insulation over lay-in ceiling tiles is prohibited unless the plenum height above the ceiling is greater than 12 ft and the conditioned space is less than 2,000 ft².
- Changes since the November 2002 draft:**
- For buildings excepted from the prohibition, a method for calculating U-factor of insulation installed over a suspended ceiling with removable ceiling tiles is added to new Joint Appendix IV.

Group 4 Measures – 40% Limitation on West-facing Fenestration

- Proponent: Variety
 - Workshop: Group 4
 - Standard: NR Envelope
 - Prescriptive limit of 40% added for west facing glass.
- Changes since the November 2002 draft:**
- Overall envelope approach methodology has been developed.
 - Standard design west-facing glass and rest of building glass reduced to 40% glass independently.



Exposed Insulation in Roofs

- Proponent: Variety
- Workshop: Group 4
- Standard: NR Envelope

Changes since the November 2002 draft:

- §118 limits the types of insulation in a protected or inverted membrane roofing systems.
- Adjustments to the effective R-value of insulation placed above the waterproof layer are in Joint Appendix IV.





NFRC Labeling Requirements

- Proponent: None
- Workshop: Not Scheduled
- Standard: Both

Changes since the November 2002 draft:

- Clarification of requirement on U-factor and SHGC rated in accordance with NFRC procedures.
- Elimination of exception for buildings with a floor area less than 100,000 ft².
- Elimination of site-assembled fenestration product category.
- A limit of 1,000 ft² for field-fabricated fenestration in buildings with more than 10,000 ft² of fenestration.

Package U-factors and SHGCs

- Proponent: None
- Workshop: Not Scheduled
- Standard: Both

Changes since the November 2002 draft:

- Opaque envelope U-factors have changed to account for changes to calculation procedures outlined in Joint Appendix IV.
- Fenestration U-factors and SHGCs have changed to account for changes in NFRC assumptions about the size of windows and the resulting change in center-of-glass to edge-of-glass ratio.



Acceptance Requirements

- Proponent: New Buildings Institute
 - Workshop: April 22
 - Standard: NR HVAC
 - ACM NJ-2005 is added to the Nonresidential ACM.
 - References to the acceptance requirements are sprinkled throughout the standard where they apply.
- Changes since the November 2002 draft:**
- Expanded to include hydronic systems and VAV systems.



Equipment Modeling

- Proponent: Pacific Gas & Electric
 - Workshop: April 2
 - Standard: NR Modeling
 - Procedures have been developed to more accurately model nonresidential HVAC equipment.
- Changes since the November 2002 draft:**
- New efficiency and capacity curves as a function of temperature have been added to the ACM Manual.



Demand Control Ventilation

- Proponent: CEC
- Workshop: April 23
- Standard: NR HVAC
- New mandatory requirement (§121(c)3 & 4).
- The requirement applies to spaces with an occupant density greater than 25 persons per 1,000 ft².

Changes since the November 2002 draft:

- Exception for classrooms.
- New acceptance requirements for all installations.
- Robust language on frequency of sensors; minimum CO₂ and outdoor air CO₂ concentrations for all installations.
- Ventilation rate changed for bars, cocktail lounges and casinos to reflect no smoking.

Cooling Towers

- Proponent: Pacific Gas & Electric
 - Workshop: April 23
 - Standard: NR HVAC
- Requirement added for flow turndown.
 - Limitation on application centrifugal fan towers.
 - Air cooled chillers prohibited for sizes less than 300 tons, with appropriate exceptions.

Changes since the November 2002 draft:

- CTI certification requirement for cooling towers larger than 300 gpm at 95 °F CWR, 85 °F CWS, and 75 °F WB.
- A proposal is being considered to only require certification for "factory assembled" cooling towers.



Hydronic System Measures

- Proponent: CEC
- Workshop: May 30
- Standard: NR HVAC
- Variable flow required chilled and hot water systems; water-loop heat pump loops.
- Chiller and boiler isolation.
- Temperature reset controls chilled and hot water systems.
- VSDs for variable flow condenser and chilled water systems >5hp.

Changes since the November 2002 draft:

- New acceptance requirements.



Nonresidential Duct Sealing and Insulation

- Proponent: Pacific Gas & Electric
 - Workshop: July 18
 - Standard: NR HVAC
- R-8 min insulation (mandatory) and duct sealing to 6% leakage (prescriptive) for small single zone systems with >25% duct area in unconditioned spaces or out of doors.
 - Leakage certified through field tests.

Changes since the November 2002 draft:

- Clarification that the air distribution system duct and plenum acceptance (§144(l)) applies only to the systems subject to duct leakage sealing (§144(k)).
- Revised NR ACM Chapter 7 field verification procedures, including addition of role for “Third Party Quality Assurance Programs.”



Improvements for Existing Light Commercial Buildings

- Proponent: Pacific Gas & Electric
 - Workshop: July 18
 - Standard: NR HVAC
- Nothing included.

Changes since the November 2002 draft:

- Requirements for duct sealing and insulation when existing buildings are altered to add or replace ducts and when HVAC units are replaced for systems meeting the criteria in §144(k). Language is in §149(b)1D.
- Added NR ACM Chapter 7 field verification procedures for additions and alterations, including the addition of role for “Third Party Quality Assurance Programs.”



ECM Motors

- Proponent: CEC
 - Workshop: August 8
 - Standard: NR HVAC
- New prescriptive requirement for ECM motors on series style boxes (§144(c)4).

No changes since the November 2002 draft.



VAV Size Thresholds

- Proponent: CEC
 - Workshop: August 8
 - Standard: NR HVAC
- Dropped VSD threshold to 10 hp (§144(c)2).
- Changes since the November 2002 draft:**
- New acceptance testing for VAV systems.



Variable Speed Single Zone Systems

- Proponent: SCE
 - Workshop: Not applicable
 - Standard: NR HVAC
- This is not implemented in the current draft. This is not likely to be considered in a later draft.
 - Will be considered for credit in the nonresidential ACM.

No changes since November 2002 draft.



Group 4 from November 2001 Workshops - HVAC

- Proponent: Variety
 - Workshop: Group 4
 - Standard: NR HVAC
 - Chiller tables modified.
 - VAV pressure sensor.
 - References updated.
- Changes since the November 2002 draft:**
- Revised performance requirements and prescriptive envelope requirements for alterations.

